README.TXT

Adaptec ASR-5085/ASR-5405/ASR-5445/ASR-5805/ASR-51245/ASR-51645/ASR-52445 Unified Serial Controllers
Adaptec ASR-2045/ASR-2405/ASR-2405Q/ASR-2805 Unified Serial Controllers
Adaptec ASR-5405Z/ASR-5445Z/ASR-5805Z Unified Serial Controllers
Adaptec ASR-5805Q/ASR-5805ZQ Unified Serial Controllers
Adaptec ASR-6405/ASR-6445/ASR-6805/ASR-6405E/ASR-6805E Unified Serial Controllers
Adaptec ASR-6805Q/ASR-6405T/ASR-6805T/ASR-6805TQ Unified Serial Controllers

NOTE: All Adaptec by PMC products are UL listed and for use only with UL listed ITE.

as of January 12, 2012

Please review this file for important information about issues
and errata that were discovered after completion of the standard
product documentation. In the case of conflict between various
parts of the documentation set, this file contains the most
current information.

NOTE: The latest firmware, BIOS, drivers and documentation can be
downloaded from www.adaptec.com when they become available.

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1. Software and Documentation

1.1. Controller & Utility Software

- Adaptec Firmware/BIOS/Driver/Utilities Version 7.3.1

  NOTE: The latest versions of firmware, BIOS, driver software and utilities can be downloaded from the Adaptec Web Site at www.adaptec.com.

- Drivers on this DVD

  The drivers on this DVD have been tested and certified on the following operating systems. In general, you can load the drivers on out-of-box operating system versions, the latest service pack, or software update. Compatibility issues may be seen with untested OS versions.

  NOTE: Not all operating systems are supported by all controllers. See notes below.

  - Windows Drivers

    - o Windows Server 2008, 32-bit and 64-bit
    - o Windows Server 2008 R2, 64-bit
    - o Windows Vista, 32-bit and 64-bit
    - o Windows 7, 32-bit and 64-bit

  - Linux Drivers

    - o Red Hat Enterprise Linux 5.5, IA-32 and x64
    - o Red Hat Enterprise Linux 6.0, IA-32 and x64
    - o SuSE Linux Enterprise Server 10, IA-32 and x64
    - o SuSE Linux Enterprise Server 11, IA-32 and x64
    - o Debian Linux 5.0.7, 6.0, IA-32 and x64
    - o Ubuntu Linux 10.10, 11.04, IA-32 and x64
    - o Fedora Linux 12, 13, 14, IA-32 and x64

  - FreeBSD Drivers

    - o FreeBSD 7.4, 8.2

  - VMware Drivers

    - o VMware ESX 4.1 Classic
    - o VMware ESXi 5.0

  - Sun Solaris Drivers

    - o Solaris 10
    - o Solaris 11 Express*

    *Not Supported on Bootable Arrays; see Section 2.3

1.2. Documentation on this DVD

- Adaptec SAS RAID Controllers Installation and User's Guide
- Adaptec RAID Controller Command Line Utility User's Guide
- Adaptec SAS RAID Controllers Quick Start Guide
- Adaptec SAS RAID Controllers README.TXT file

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2. Installation and Setup

2.1 Installation Instructions

The Adaptec SAS RAID Controllers Installation and User's Guide contains complete installation information for the controllers and drivers, as well as complete instructions for all utilities. The Adaptec RAID Controllers Command Line Utility User's Guide contains complete installation information for ARCCONF, Remote ARCCONF, and the Adaptec CIM Provider. The Adaptec Storage Manager User's Guide contains complete installation information for the Adaptec Storage Manager software.

2.2 Windows Setup on Adaptec Series 6 Controllers

On Windows 2008 R2 64-bit systems, the Setup program tries to load Inbox storage drivers first, by default. As a result, you must load the driver for Adaptec Series 6/6Q/6E/6T controllers TWICE.

The first time you load the driver, the OS displays the message "No drives were found'. Select 'Load Driver' again, uncheck "Hide drivers that are not compatible...', then select the Series 6 controller driver. On the second attempt, the driver will load successfully.

2.3 Solaris 11 Express Setup

Installing Solaris 11 Express on a bootable array is not supported in this release.

2.4 Fedora Linux Setup

To avoid a known PCIe Active State Power Management issue under Fedora Linux 13 and 14, you must add the OS option `pcie_aspm=off` in GRUB bootloader file "menu.lst". Follow these instructions:

1. When the first Fedora installation screen appears, press the `Tab` key.

2. Before pressing the first `reboot` button, edit grub/menu.lst:

   - Press Alt+F2
   - cd /mnt/sysimage/boot/grub/
   - Open the menu.lst file

3. Add `pcie_aspm=off` just after `rhgb quiet`. The new line should look like this (wrapped for clarity):

```
root (hd0,0)
kernel /vmlinuz-2.6.33.3-85.fc13.i686.PAE ro root=/dev/mapper/VolGroup-lv_root
rd_LVM_LV=VolGroup/lv_root rd_LVM_LV=VolGroup/lv_swap rd_NO_LUKS rd_NO_MD
rd_NO_DM LANG=en_US.UTF-8
SYSFONT=latarcyrheb-sun16 KEYTABLE=us rhgb quiet pcie_aspm=off
```

2.5 SCSI Device Setup on Debian and Ubuntu Linux

- After installing the Debian Linux driver, you must replace the SCSI Device Partition Name in Debian's GRUB bootloader with a UUID. Failure to update the partition name may cause the system to hang when the OS is rebooted. In the GRUB bootloader file "menu.lst", replace the SCSI device partition name (for instance, /dev/sda1), with UUID=<string>.

- After installing the Ubuntu Linux driver, you must increase the SCSI command timeout value from 30 seconds (the default value) to 90 seconds. Failure to increase the timeout may cause the system to hang with a EXT4 error when a good drive is removed from a rebuilding array. Use these commands to increase the timeout in SYSFS, assuming /dev/sda, /dev/sdb, and /dev/sdc are the device LUNs on the Ubuntu Linux host:

```
echo ``90``> /sys/block/sda/device/timeout
echo ``90``> /sys/block /sdb/device/timeout
echo ``90``> /sys/block/sdc/device/timeout
```

2.6 Other Linux Setup Issues

Before installing the Linux operating system on a logical drive, be sure to clear (remove) old data first. If you do not remove old data prior to installation, the OS may not boot. As a workaround, use the boot parameter 'aacraid.wwn=2'.

2.7 Adaptec CIM Provider Setup

This release supports the Adaptec CIM Provider on VMware ESXi 4.1 and VMware ESXi 5.0 only. The documentation (in the CLI guide) INCORRECTLY states that you can install the CIM Provider on VMware ESXi 4.0, which is not supported.

2.8 Adaptec maxCache Setup

- Adaptec maxCache SSD caching is supported on Adaptec Series Q controllers only.
- Adaptec Series Q controllers support any maxCache-compatible SSD on the compatibility list; see www.adaptec.com/compatibility for a full list of compatible SSD drives.
- You can install a maximum of 8 SSDs on a controller for maxCache caching applications.

See the user's guide for complete maxCache SSD installation and setup instructions.

2.9 Power Management Setup

You must use a compatible combination of Adaptec Storage Manager and controller firmware and driver software to use the power management feature. All software components must support power management. You can download the latest controller firmware and drivers from the Adaptec Web site at www.adaptec.com.

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3. General Cautions

- While an array is builing or cleared, do not remove and re-insert any drive in that array. Doing so may cause unpredictable results for any arrays on the controller.
- Do not move drives containing an array from one controller to another while the power is on. Doing so could cause the loss of the array configuration or data, or both. Instead, power off both affected controllers, move the drives, and then restart.

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4. Known Limitations

4.1 ACU Utility

- ACU for DOS is deprecated and no longer supported.
- For degraded arrays on Adaptec Series 6E controllers, the ACU displays "junk' characters in the array properties list for the missing drive.
- On some Intel and IBM systems, when you try to run the ACU utility, this message appears:

  "Not enough free memory to load the utility!
  Press any key to attempt loading the utility forcibly
  OR Wait for the system initialization to be completed
  [Default]"

  This is normal. On Intel systems, wait for the system

initialization to be completed. Then the ACU will run. On IBM systems, press any key when prompted to load the utility forcibly.

- The ACU erroneously displays deleted logical drives in the JBOD list. The logical drive(s) continue to appear in the JBOD list until you delete all of the JBODs.

- With some enclosures, the ACU displays incorrect box/slot information for managed disk drives; for example, Exp/Phy instead of Box/Slot.

4.2 AFU Utility

- When running the AFU in Menu Mode, you can update (flash) only one controller at a time. You must reboot the system before updating the next controller.

- Flashing a Series 5 high-port controller (51245, 51645, 52445) with down-level firmware and an older version of the AFU crashes the system. To recover, you must use a Mode 0 reset using the latest firmware version. See the user's guide for details on the Mode 0 reset method.

4.3 Creating an Array from the Adaptec Installation DVD

When you create an array with Adaptec Storage Manager in bootable-CD Mode, the maximum size of the array is 2TB.

4.4 SuSE Linux Enterprise Server 10 with Service Pack 2

If your boot array is installed on the controller, and the boot OS is SLES10 SP2 with driver version 1.1.5-2458, you must add 'aacraid.wwn=1' to the kernel boot command line. Alternatively, install the latest aacraid driver.

4.5 Using the Controller with an Adaptec S50 JBOD Enclosure

Temperature warnings from the Adaptec S50 JBOD Enclosure with firmware version T016 are not shown in Adaptec Storage Manager (or on the enclosure). To correct the problem, upgrade to the latest firmware version.

4.6 Hot-adding Disk Drives

- If you hot-add multiple disks to a large configuration (100 disk drives or more), it may take a significant amount of time before those disk drives appear in Adaptec Storage Manager.

- With Intel Backplanes AXX4DRV3GEXP and AXX6DRV3GEXP, if a drive bay is empty when the enclosure is powered up, then a SATA disk drive is hot-added into the empty bay, the controller does not detect the new disk drive. To work around this issue, remove and re-insert the SATA drive.

4.7 SuperMicro Disk Drive Enclosures

- Due to an auto backplane detection issue with SuperMicro SC836TQ enclosures, the red fault LED does not go on when a failed member of an array is pulled from the enclosure, for both SGPIO and I2C modes. WORKAROUND: Use the BIOS utility to force the backplane type to I2C or SGPIO.

- If the controller does not detect disk drives installed in a SuperMicro M28E2 Mobile Rack, use backplane SAS connectors marked with "SAS In" only.

4.8 Using the Controller with a Seagate Barracuda 1TB SATA Drive

To ensure reliability when using Adaptec Series 2 and Series 5 controllers with a Seagate Barracuda ES.2 1TB SATA Drive

(ST31000340NS), Adaptec recommends using Seagate firmware version AN05 or SN06 or higher.

4.9 Intel SE7525RP2 and SE7320EP2 Motherboards

The Intel SE7525RP2 and SE7320EP2 motherboards do not support Mode 0 flash. These motherboards use 64-bit PCI addressing. The AFU currently supports 32-bit PCI addresses only.

4.10 Online Capacity Expansion (OCE) and RAID Level Migration (RLM) Issues

- The system may fail to boot after performing a boot drive OCE/RLM. To correct the problem, verify that the boot drive is still listed as the first logical device in Adaptec Storage Manager (ASM). If not, use the BIOS utility to reselect the proper boot device.

- After performing an OCE on a Solaris 10 U9 system, the OS may fail to start if you pull a drive from the reconfigured logical device before rebooting.

- Removing a member of an array while an OCE is in progress can cause the array to be deleted.

NOTE: We strongly recommend that you do not remove any drive during an OCE/RLM.

- This release supports a maximum of 8 concurrent OCE tasks in the RAID array migration wizard. The following RLM and OCE tasks are NOT supported:

  - RAID 50 to RAID 5 RLM
  - RAID 60 to RAID 6 RLM
  - RAID 50 to RAID 60 OCE

4.11 Power Management under FreeBSD

The FreeBSD driver does not support power management in this release.

4.12 Failed Arrays under FreeBSD

- On FreeBSD 7, deleting an array under IO load causes the OS to reboot automatically.

- On FreeBSD 8, if an array fails (including pulling a drive from the array), the firmware may crash causing the OS to hang or reboot automatically.

4.13 Power Management with Seagate SAS Drive ST31000640SS

Power Management is not supported by the Seagate ST31000640SS SAS drive. (The drive powers down but will not power up without rebooting.)

4.14 Linux Cache Synchronization

With Linux driver 1.1-5-2459 (or higher), you may see an improvement in performance if you suppress cache synchronization. For a controller with battery back-up, add 'options aacraid cache=6' to the /etc/modprobe.conf.local file. To completely suppress cache synchronization, add 'options aacraid cache=2'. Then, reboot. Note that the smaller value provides no protection in case of a power outage.

4.15 Listing Devices in VMware ESX 4.x Console

After deleting an array with ARCCONF, the VMware ESX Console will hang if you list devices with the 'fdisk -l' command. As a work-around, rescan first, then try 'fdisk -l'.

4.16 BIOS Hangs When Booting RAID Controller with Batteryless Backup (ZMCP)

Possible Causes: After a system shutdown, the ZMM-100DB daughterboard remains active for several minutes. The Super Cap connector may have been improperly removed and/or re-inserted with a charge still present.

Solution: Plug the Super Cap connector in when the system is off and, if the yellow activity LED is illuminated on the ZMM-100DB daughterboard attached to RAID Controller, wait for the LED activity indicator to go out. This may take several minutes. The system should then boot normally.

4.17 Updating Firmware on Hitachi HUS1514xxVLS300 SAS Drives

Firmware upgrade on Hitachi HUS151473VLS300 and HUS151436VLS300 SAS drives is not supported for packet sizes below 4K (512/1024/2048).

4.18 Installing Windows OS from Direct-Attached Non-DASD Device

Adaptec RAID controllers do not support Windows OS installation from direct-attached Non-DASD devices ("Direct Access Storage Devices"), such as a tape drive, CD-ROM, or DVD-ROM. Adaptec recommends using a motherboard IDE or SATA DVD-ROM/CD-ROM device to install the Windows OS on a RAID array.

4.19 maxCache SSD Cache Performance

The maxCache cache contents is lost if the OS is not shut down cleanly (for example, by pressing the reboot button or pulling the power). When the system is restarted, the cache is rebuilt. Until that time, you may see a temporary loss in performance.

4.20 Exceeding 2TB LUN Size on VMware ESX Server

Under VMware, if you create a logical drive with greater than 2TB of capacity, the OS will only be able to access the remaining storage above 2TB. For instance, with the 3.5TB LUN, only 1.5TB will be accessible; with a 5TB LUN, only 1TB will be accessible (first 2TB+2TB are skipped); and so on.

4.21 PHY Rate Limitations on Western Digital Hard Drives

To avoid data-phase errors with certain Western Digital hard drives attached to Adaptec Series 5 controllers, the PHY rate must be set 1.5Gb/s rather than the maximum rate of 3.0Gb/s.

- For Western Digital WD2002FYPS and WD20EADS hard drives, the PHY rate is set automatically to 1.5Gb/s.

- You can set the PHY rate manually to Auto (default), 1.5Gb/s, or 3.0Gb/s in the BIOS utility.

NOTE: For Adaptec low-port RAID controllers, the device properties in ASM and the BIOS utility will continue to report the maximum PHY rate (3.0Gb/s), not the reduced rate. For high-port controllers, the PHY rate is reported correctly.

4.22 Changing the Stripe Size for Large RAID Arrays

For large RAID arrays, a RAID-level migration may fail with a firmware crash if you reconfigure the array with a different stripe size. No data is lost, however.

Known migrations that result in a FW crash include:

- 16/32/64/128 drive R0- 256/16 to 16/256 stripe change
- 16/32/64/128 drive R0- 512/16 to 16/512 stripe change
- 16/32/64/128 drive R0- 1024/16 to 16/1024 stripe change
- 16/32 drive R5- 16 to 512/1024 stripe change

- o 16/32 drive R5- 512/1024 to 16 stripe change
- o 16/32 drive R6- 1024/16 to 16/1024 stripe change

4.23 Hot-Adding maxCache SSDs

If you remove two or more maxCache SSDs then re-insert the drives at the same time, only one will be recognized as part of the maxCache pool. To reconstitute the pool, use Adaptec Storage Manager or the BIOS utility to reconfigure the maxCache cache.

4.24 Some SSDs Appear as SATA Drives

Some solid state drives (such as the MemoRight MR25.2-S032G) identify themselves as ROTATING media. As a result, these SSDs:

- o Appear as SATA drives in the ASM Physical Devices View
- o Cannot be used as Adaptec maxCache devices
- o Cannot be used within a hybrid RAID array (comprised of SSDs and hard disks)

4.25 Mismatch in RAID x0 creation in BIOS and ASM

The BIOS utility creates RAID x0 arrays with an odd number of drives by default. Adaptec Storage Manager creates RAID x0 arrays with an even number of drives by default.

4.26 WDC WD3200BJKT-00F4T SATA Drives with Promise J630 Enclosures

A compatibility issue between Western Digital WD3200BJKT-00F4T SATA drives and Promise J630 enclosures can result in a firmware crash during a RAID array build or bus rescan.

4.27 SATA 6G Drives Not Detected on Promise and Intel Backplanes

- o With Promise J830s enclosures, SATA 6G drives are reported as 3G in ASM and the BIOS utility, due to a speed negotiation issue between the drive and the expander.

- o With Adaptec Series 5 controllers and a Promise J830s enclosure running Firware version v6.12, SATA 6G drives cause the BIOS to hang. WORKAROUND: use firmware version v6.04.

- o With Intel AXX6DRV3G and AXX6DRV3GEXP backplanes, SATA 6G drives are not detected in the BIOS. With Intel AXX6DRV3G backplanes, the BIOS hangs; with Intel AXX6DRV3GEXP backplanes, no drives are detected in the BIOS utility.

4.28 Samsung Spinpoint SATA Drives Timeout on I/O Load

With Samsung Spinpoint SATA drives, models HD103UJ/HD103UI/HE103UJ, the controller can reset due to a timeout when the drive is under heavy I/O load.

4.29 RAID Array Creation Issue With STEC MACH 8 SSDs

With STEC MACH 8 SSDs with firmware version 1766, RAID array creation fails when using the Adaptec Storage Manager wizard. WORKAROUND: Upgrade to the latest STEC firmware version to resolve the problem.

4.30 Dual-Port SATA Enclosures

Dual-ported SATA enclosures are not supported in this release. However, on Series 6 controllers (only), redundant paths to SATA disks are detected in the firmware, but treated and shown (in ASM, BIOS, etc) as two single path enclosures with the correct number of drives. Although the drives are shown as available for configuration, the configuration will fail. The firmware currently supports dual path SAS drives only.

NOTE: Mixing SATA and SAS drives in the same logical device
is not recommended.

4.31 Xtore and Xyratex Enclosure Timeout

- With Adaptec Series 2, 5, and 6 controllers, Xtore XJ-SA12-005 and XJ-SA26-224R-S enclosures timeout when they receive a Diagnostic Page 04 command. The error occurs at approximately 10 minute intervals (and is reported in the ASM controller log file), but has little or no effect on performance.

- With Adaptec Series 5 controllers, Xyratex RS-1603-E3-EBD-2 enclosures periodically timeout when they receive a SES2 diagnostic command, due to a protocol violation. The error occurs at 5 to 15 minute intervals, and may degrade performance.

4.32 Boot delay with Plextor PX-716SA DVD-ROM Drive

When booting from a Plextor PX-716SA DVD-ROM drive attached directly to an Adaptec controller, the boot appears to fail with a "Could not find boot CD-ROM" error, but resumes and boots successfully if you wait approximately 30 seconds or until the front LED light turns green.

4.33 Series 6 Controllers Hang on Warm Reboot on Some ASUS Motherboards

Due to a PCIe configuration problem with ASUS P7P55-WS, KCMA-D8, and KGPE-D16 motherboards, Adaptec Series 6 controllers may hang on warm reboot if installed in a slot with x8 links. (The problem is not seen with Adaptec Series 5 controllers.)
WORKAROUND: Use a slot with x16 links.

4.34 HDA Mode Reset for Adaptec Series 6 Controllers

Adaptec Series 6 controllers do not support Mode 0 reset, using the AFU utility on the Adaptec Installation DVD. To flash a Series 6 controller using the HDA mode jumper on the controller board, you must use the PFU.exe utility, which uses a FDL firmware file (as opposed to a UFI file) to reset the board. PFU.exe is available only from your Adaptec by PMC service representative; it is not included on the installation DVD. For the location of the HDA jumper on Series 6 controllers, see the user's guide.

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